FAA-E-2170a
July 30, 1968
SUPERSEDING
FAA-E-2170, 11/24/64

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION SPECIFICATION

SWITCH, FOOT-BAR

1. SCOPE

1.1 Scope.- The equipment specified herein is an assembly of dust-proof enclosed switches actuated by foot pressure on a longitudinal bar for control of radio channels in the FAA air/ground communication system.

2. APPLICABLE DOCUMENTS

2.1 FAA specifications.- The following FAA specifications, of the issues specified in the invitation for bids, form a part of this specification:

FAA-D-1272	Instruction Booklets, Electronic Equipment
FAA-G-2100/1	Electronic Equipment, General Specification, Part 1, General Requirements for All Equipments

2.2 Military specifications.- The following Military specifications, of the issue in effect on date of the invitation for bids, form a part of this specification:

MIL-I-45208	Inspection System Requirements
MIL-E-17555	Electronic and Electrical Equipment and Associated Repair Parts, Preparation for Delivery of

(Copies of this specification, and of the applicable specifications and drawings, may be obtained from the Federal Aviation Administration, Washington, D. C. 20590, Attention: Contracting Officer. Requests should fully identify material desired, i.e., specification numbers, dates, amendment numbers, complete drawing numbers; also requests should state the contract involved or other use to be made of the requested material.)

(Information on obtaining copies of Military specifications is given in Supplement-1 to FAA-G-2100/1.)

3. REQUIREMENTS

3.1 Equipment to be furnished by the contractor.- Each equipment furnished by the contractor shall be complete in accordance with all specification requirements. Instruction booklets shall be furnished in accordance with FAA-D-1272 and 3.4.3 hereof, in quantities specified in the contract schedule.

3.2 Ambient conditions and power source.- The ambient conditions shall be those of Environment I, as defined in 1-3.2.23 of FAA-G-2100/1. The power source for switch operation shall be 48 V DC (design-center value, 1-3.2.21 of FAA-G-2100/1.).

3.3 Performance.- Performance of the foot-bar switch assembly shall meet or exceed the requirements of the following subparagraphs over the range of normal test conditions.

3.3.1 Operating travel.- Overall motion of the foot-operated bar shall exceed a vertical distance of 0.5 inches and shall be not less than 10° at the pivot shaft.

3.3.1.1 Switch operation.- The switch shall operate (close) not later than 7° nor before 4° of pivot shaft motion.

3.3.2 Operating pressure.- Pressure on the lever arm at the axis of the foot-bar hole shall be 2-1/2 ± 1/2 pounds to just hold the arm against the bottom stop. The requirement applies to each housing prior to assembly with the foot-bar. It shall be the responsibility of the contractor to reform the spring as necessary to meet this requirement.

3.3.3 Switch.- All switches shall be hermetically sealed mercury actuated units Honeywell Type AS431C1 or equal, mounted in Honeywell clip 2MR4B or equal.

3.3.3.1 Ratings.- The switch shall be rated as 3° differential and not less than 5a at 48 V DC.

3.3.3.2 Life.- The switch life shall be rated to exceed 5 million operations.

3.3.4 Insulation.- The insulation shall be not less than 1 megohm between each wire and all others and to all metal parts.

3.4 Construction.- Construction shall conform to Figures 1 and 2 hereof.

3.4.1 Housing alignment.- Mounting surfaces of the two housings after complete assembly shall be aligned to within 0.005 inch horizontally. The non-skid strips shall be non-marking.

3.4.2 Terminal block.- The terminal strips shall be marked in accordance with FAA-G-2100/1. No solderless terminals shall be used.

3.4.3 Instruction booklets.- In addition to the requirements of FAA-D-1272, adjustment of switch position shall be adequately described.

3.4.4 Nameplate.- Nameplate title (1-3.13, FAA-G-2100/1) shall be:
SWITCH, FOOT-BAR-OPERATED .

4. QUALITY ASSURANCE PROVISIONS

4.1 General.- The contractor shall provide and maintain a quality control program which fulfills the requirements of Military Specification MIL-I-45208A, Inspection System Requirements. The contractor's quality program shall be a scheduled and disciplined plan of events integrating all necessary inspections and tests required to substantiate product quality during design development, purchasing, subcontracting, manufacture, fabrication, processes, assembly, acceptance, packaging, and shipping; and where required by the contract site installation. The contractor shall perform or have performed all inspections and tests required to substantiate product configuration and conformance to drawings, specifications, and contract requirements and shall also perform or have performed all inspections and tests otherwise required by the contract. An FAA Representative will witness the contractor's testing and inspections and will perform such visual and other inspections as deemed necessary to assure compliance with contract requirements.

4.2 Design qualification tests.- The following design qualification tests shall be made under normal test conditions.

Test	Paragraph
Operating travel and pressure Ratings (vender's certified data will be acceptable)	3.3.1, 3.3.2 3.3.3.1, 3.3.3.2

4.3 Type tests.- Not required.

4.4 Production tests.- The following production tests shall be made:

Test	Paragraph
Switch operation	3.3.1.1
Insulation	3.3.4
Housing alignment	3.4.1

5. PREPARATION FOR DELIVERY

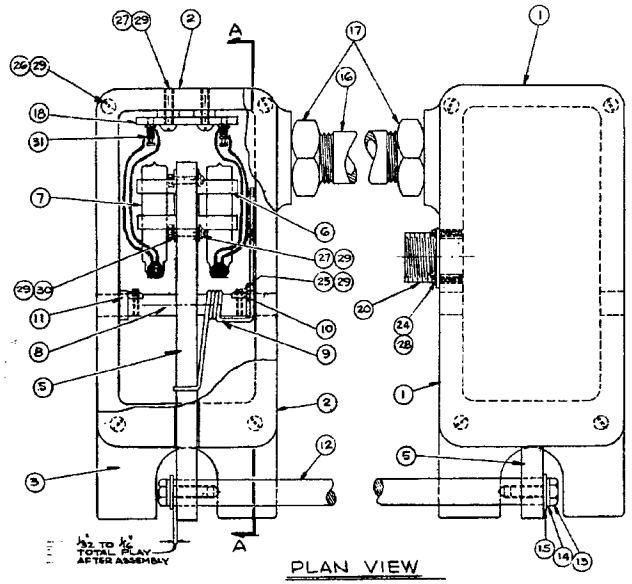
5.1 General.- See MIL-E-17555.

6. NOTES

6.1 None.

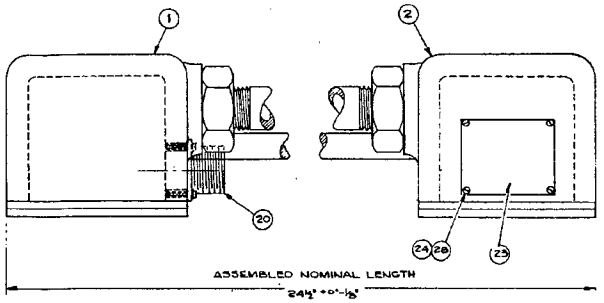
* * * * *

For Figures 1 and 2, see pages 5 to 7.

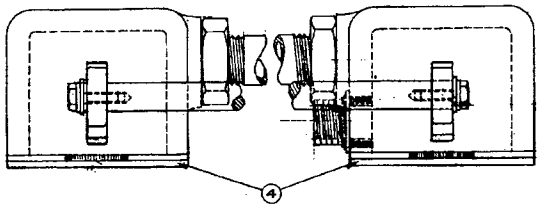


PLAN VIEW

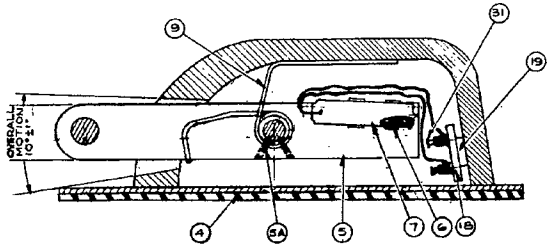
NOTE:
INTERIOR DETAILS OMITTED IN THIS SIDE.



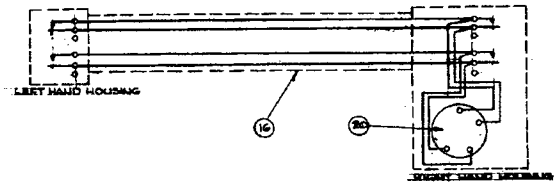
REAR VIEW



FRONT VIEW



SECTION A-A



SCHEMATIC WIRING DIAGRAM

PART NO.	QNTY	DESCRIPTION
1	1	RIGHT HAND HOUSING
2	1	LEFT HAND HOUSING
3	2	BASE PLATE, HC.R STEEL
4	2	MAT, NON-SKID (NEOPRENE, DIAMOND RIBBED)
5	2	LEVER, ARM, BRASS
5A	4	SCREW, SET, 6-32 x 3/16 CUP/HEX
6	4	CLIP [3.3.3]
7	4	SWITCH [3.3.3]
8	2	PIVOT SHAFT
9	2	SPRING, PIVOT SHAFT, MUSIC WIRE, 0.080" DIA.
10	4	STOP, PIVOT SHAFT
11	2	SPACER, PIVOT SHAFT
12	1	FOOT BAR, #302 SST, PASSIVATE AFTER MACHINING
13	2	BOLT, HEX 1/4-20 x 3/8 BR. N.P
14	2	LOCKWASHER, SPRING, 1/4 P.B. N.P.
15	2	WASHER, FLAT, 1/4 I.D. 3/8 TO 1/2 OD. 0.040 TO 0.060 THK, BR. N.P
16	1	PIPE, 1/2 LRS., BR. N.P.
17	2	LOCKNUT, 1 5/16 HEX, 1/2-14 TAP, 1/2 THK, BR. N.P.
18	2	TERMINAL BOARD
19	2	SPACER, TERMINAL BOARD, 1/8 BRASS, N.P.
20	1	CONNECTOR, AMPHENOL 97-3102A-12SL-8449
21	1	CONNECTOR, AMPHENOL 97-3106A-12SL-8449
22	1	CABLE CLAMP, AN-3057-6
23	1	NAMEPLATE [3.4.4]
24	8	SCREW 4-40 x 3/8 B.H. N.P.
25	4	SCREW 6-32 x 3/8 B.H. N.P.
26	8	SCREW 6-32 x 1/2 B.H. N.P
27	8	SCREW 6-32 x 3/8 B.H. N.P.
28	8	LOCKWASHER #6 INTERNAL SHAKEPROOF
29	24	LOCKWASHER #6 INTERNAL SHAKEPROOF
30	4	NUT, 6-32 B.H. N.P.
31	8	TERMINAL, CAMBION #1789, OR EQUAL.

FIGURE 1

SWITCH, FOOT BAR ASSEMBLY

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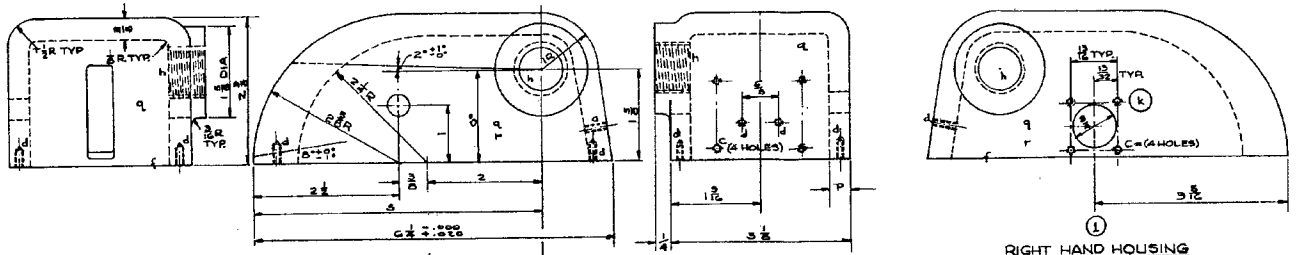
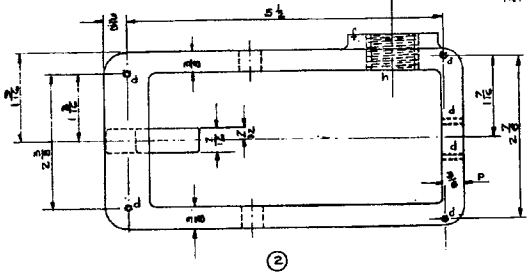
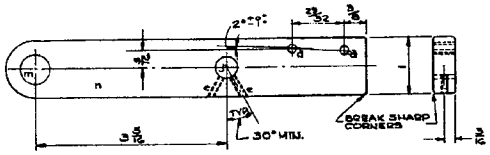


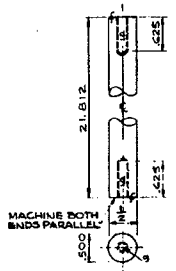
RIGHT HAND HOUSING



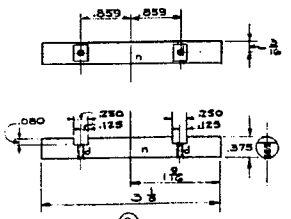
LEFT HAND HOUSING
GENERAL DETAILS



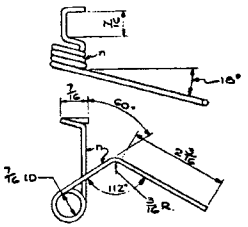
LEVER ARM



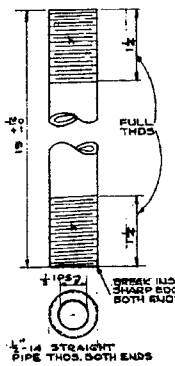
FOOT BAR



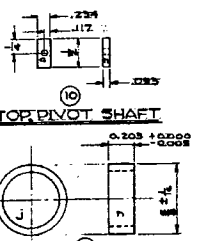
PIVOT SHAFT



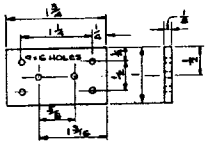
SPRING PIVOT SHAFT



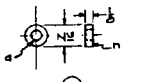
PIPE



SPACER, PIVOT SHAFT.
SCALE 1" = 2"

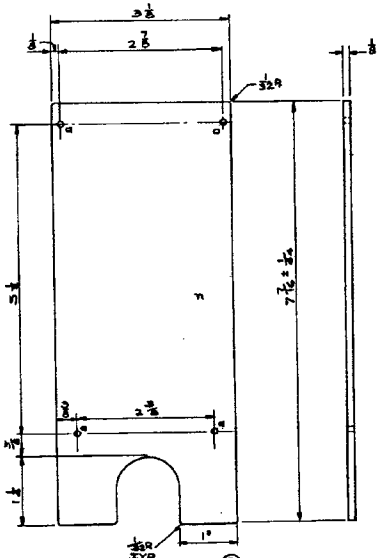


TERMINAL BOARD

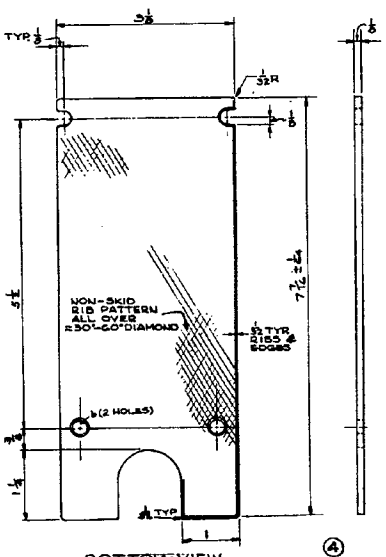


SPACER, TERM. BD.

STOP, PIVOT SHAFT



BASE PLATE



MAT, NON-SKID

TABLE OF HOLE SIZES AND INSTRUCTIONS

a.	#25 DRILL (G-32 CLEAR)
b.	5/16" DIA.
c.	4-40 TAP
d.	G-32 TAP
e.	8-32 TAP
f.	MILL FINISH
g.	1/4"-20 TAP
h.	1/2"-14 THREAD OR TAP
j.	REAM 0.350" +.002 -.000
k.	LINE REAM AS IN "J"
m.	REAM 0.505" +.002 -.000
n.	NICKEL PLATE
p.	CASTING WALL MINIMUM 1/8"
q.	REMOVE ALL EXTERNAL BLEMISHES AND BURRS.
r.	ALL CASTINGS, MANGANESE BRONZE, B-147 ASTM, GRADE 8A.
s.	ALL PARTS BRASS UNLESS OTHERWISE SPECIFIED.

FIGURE 2

SWITCH, FOOT BAR PARTS

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SPECIFICATION ANALYSIS SHEET

This sheet is provided for obtaining information on the use of this specification by either Contractor or Government personnel. Recommendations should be based on actual or potential savings and advantages to the Government or users. Return of this form will be appreciated.

SPECIFICATION NUMBER AND TITLE	CONTRACT NUMBER

SUBMITTING ORGANIZATION	ADDRESS

SPECIFICATION USED IN:

- ☐ Direct Government Contract - No: _____
- ☐ Government Subcontract - No: _____
- ☐ Other - _____

1. Has any part of the specification created problems or required interpretation?

   A. Give paragraph number and wording.

   B. Recommendations for correcting the deficiencies.

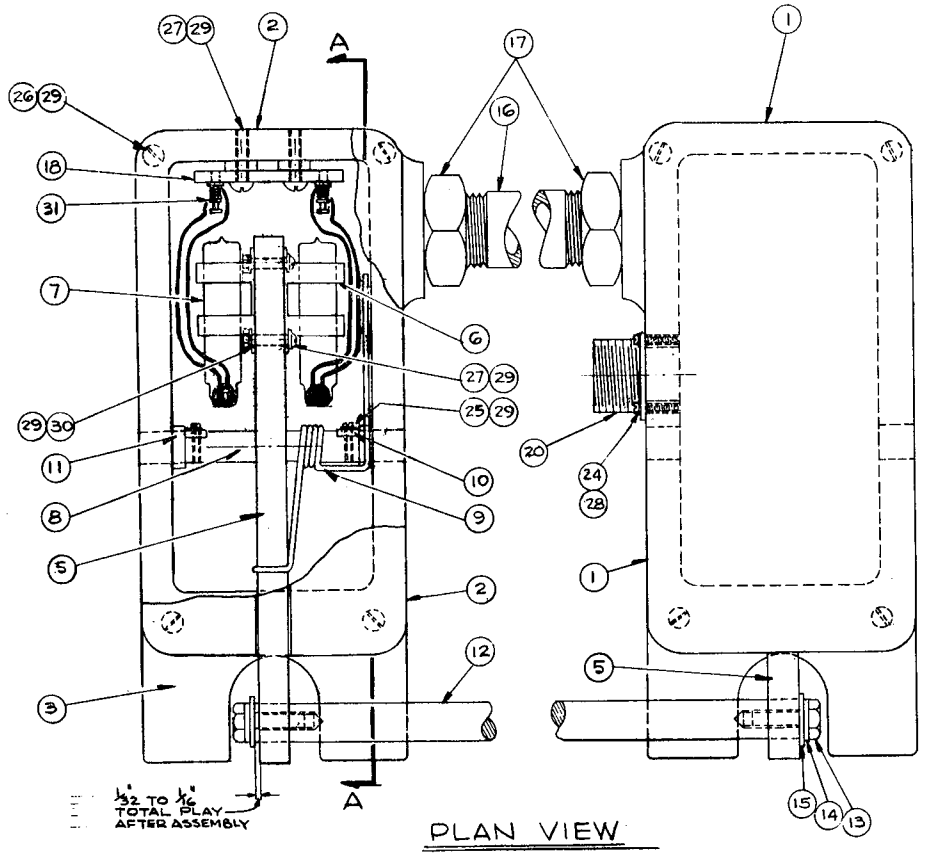
2. Comments on any specification requirement considered too rigid?

3. Is the specification restrictive? ☐ Yes: ☐ No

   If "yes", in what way?

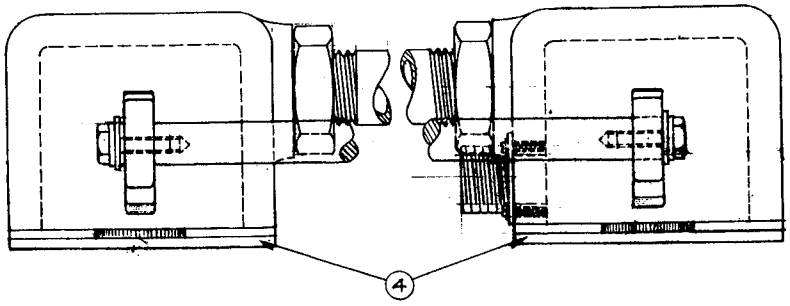
4. REMARKS. "Attach to this form any additional pertinent data which may be of use in improving this specification. Form with attachments should be mailed together in an envelope addressed as shown on reverse side".

SUBMITTED BY	DATE

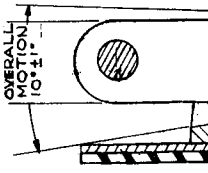


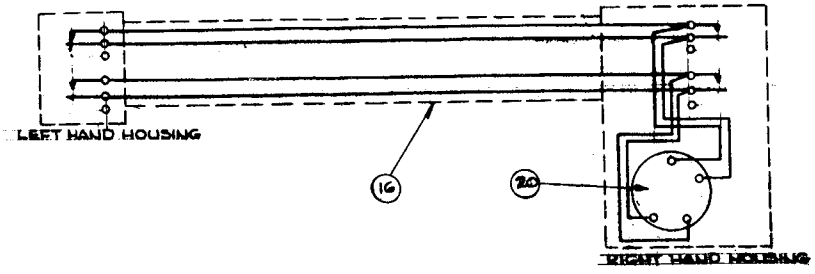
PLAN VIEW

NOTE:
INTERIOR DETAILS OMITTED IN THIS SIDE.

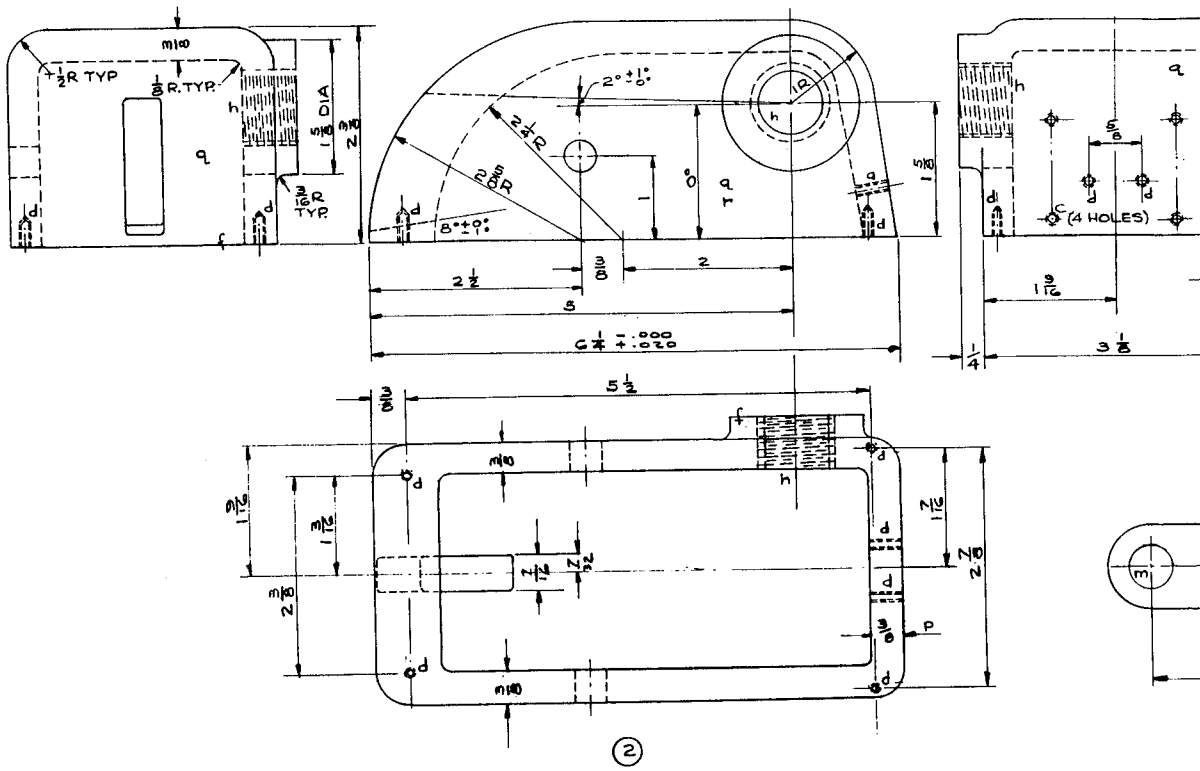


FRONT VIEW



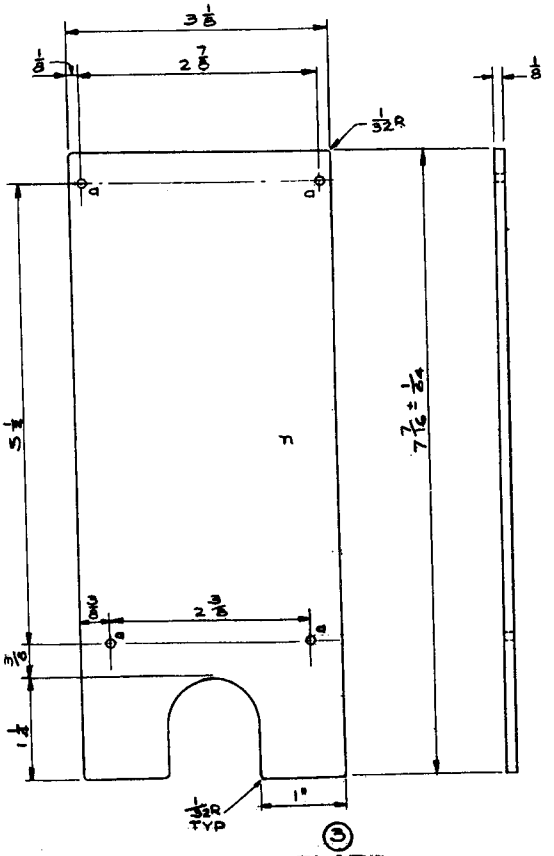


SCHEMATIC WIRING DIAGRAM

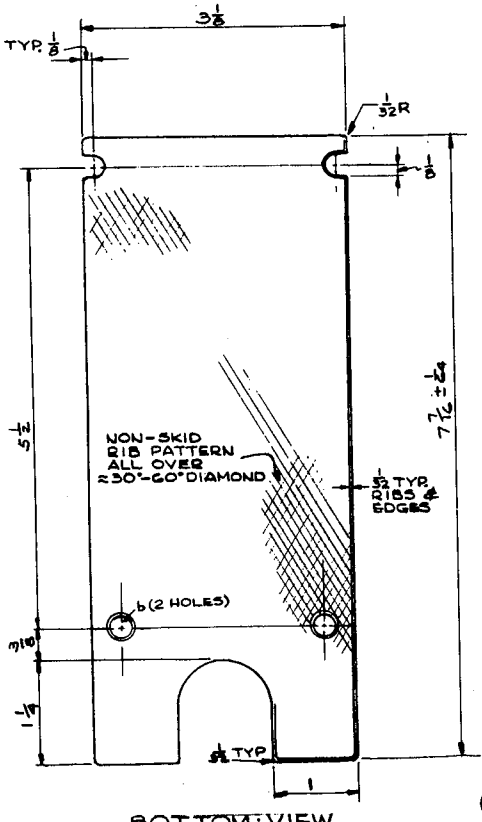


② LEFT HAND HOUSING

GENERAL DETAILS



③ BASE PLATE



BOTTOM VIEW

MAT